

REMARKS/ARGUMENTS

I. Concerning the Amendments

Claim 39 is amended to improve its clarity. Claims 1, 35 and 41 are amended to incorporate the subject matter of Claims 2 and 26, which are cancelled. These amendments are in response to the citation of the JP '810 reference, which relates to photographic coatings and substrates but not to printable paper and paperboard.

II. Concerning the Rejection under 35 U.S.C. 112

The rejection of Claim 39 under , 2nd paragraph, is believed to be moot in view of the amendment to Claim 39 presented herein.

III. Concerning the Rejection over Prior Art

The latest office action contains approximately 11 rejections based on various combinations of claims and references. For the purposes of this response, generally speaking, Applicants elect not to separately address rejections that only affect dependent claims; rather, the patentability of each dependent claim stands or falls with that of the independent claim from which it depends.

A. Independent Claims 1 and 35

Claims 1-6, 8-22, 24-27, 29-31, 34, 35, 37 and 42-44 stand rejected under 35 USC 103(a) as being unpatentable over WO 01/54828 (hereinafter Tetra Laval) in view of Wittosch et al. '129 (hereinafter Wittosch) and Katagiri et al. (hereinafter Katagiri).

Claim 1 claims a method of producing a coated substrate having specified barrier functionality using a multilayer curtain coating process wherein the curtain interface layer has a viscosity of at least about 100 centipoise and the curtain has a total solids content of at least about 40 weight percent.

Independent Claim 35 is directed to a method of multilayer curtain coating wherein the curtain has an interface layer having a viscosity of at least about 100

centipoise, and provides at least two different barrier functionalities, and is contacted with a moving substrate having a velocity of at least about 200 m/min.

Wittosch discloses a process for making multilayer coatings by means of sequential single layer coating steps. The finished coating provides wax-free resistance to water and water vapor. The resulting coated paper is recyclable and repulpable since it is wax-free. At column 3, line 58, he teaches that the coated paper stock also exhibits grease resistance. He teaches that the viscosity of a singly-applied coating dispersion is preferably in the range of 20 to 1000 centipoise. At column 6, he discloses that his coatings can be applied using various methods, including single layer curtain coating. Coating speed is not mentioned. He discloses that the solids content of each singly-applied coating layer is generally greater than 20%, and preferably is from 40 to 55%.

Tetra Leval, at page 4, teaches that a Wittosch-type process, e.g. applying single wet coating layers with intermediate drying steps, is "not advantageous" because of the risk of crack formation or damage to the substrate. The Tetra Laval invention is a multilayer packaging laminate comprising at least one layer having a wet thickness of no more than 20 μm and at least one layer having oxygen barrier or oxygen scavenging properties. Multilayer curtain coating is used wherein the bottom layer has a "low viscosity" preferably of 50 mPas or less, more preferably from 5 to 10 mPas. The total solids content of the applied layers preferably is between about 5 and 25%. Coating speed is not mentioned.

Katagiri discloses a multilayer curtain coating process wherein the curtain has at least three layers, and wherein at least one intermediate layer has a viscosity of more than 300 mPas. Katagiri is directed to solving a problem related to splicing. Example 1 uses an interface layer having a viscosity of 150 mPas at a shear rate of 10^{-1} , a coating speed of more than 200 m/min., and a solids content of 5%. However, based on his Comparative example 2, Katagiri concludes in paragraph [0052] that an interface layer viscosity of 350 mPas was unacceptable since a stable curtain could not be formed.

The Office must show three elements to establish a prima facie case of obviousness: (1) some suggestion or motivation to modify a reference or to combine

reference teachings; (2) a reasonable expectation of success with the modification; and (3) a prior art reference or combined references that teach all of the claim limitations. MPEP §2143. Applicant submits that all of these elements have not been established on the record and that, therefore, no prima facie case of obviousness has been established.

Regarding the first element, Applicants respectfully submit that neither Tetra Laval nor Wittosch nor Katagiri contain any teaching that would motivate one of ordinary skill in the art to combine their teachings, and Examiner has not provided any explanation of where such motivation can be found. Katagiri is relevant to the photographic field and is directed to the preparation of low solids content coatings. Both Wittosch and Tetra Laval are in the general field of paper coating, but they are disconnected references that do not provide one of ordinary skill in the art with any motivation to combine their teachings. For example, Wittosch is directed to the production of recyclable and repulpable coated paper stock, whereas Tetra Laval is directed to a multilayer packaging laminate. Nothing in the references would motivate one of ordinary skill in the art to combine their teachings.

Applicants further request reconsideration in view of fact that the rejection appears to be based upon a hindsight reconstruction of the invention. As stated in In re Spinnoble, 160 USPQ 237, 243 (CCPA 1969): "The court must be ever alert not to read obviousness into an invention on the basis of the applicant's own statements; that is, we must view the prior art without reading into that art appellant's teachings. In re Murray, 122 USPQ 364 (CCPA 1959); In re Sporck, 133 USPQ 360 (CCPA 1962). The issue then, is whether the teachings of the prior art would, in and of themselves and without the benefits of appellant's disclosure, make the invention as a whole obvious. In re Leonor, 158 USPQ 20 (CCPA 1968)." (Emphasis in original.) "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." W. L. Gore & Associates, Inc. v. Garlock, Inc., 220 USPQ 303, 312-313 (Fed. Cir. 1983). Such use of hindsight is clearly forbidden. In re Skoll, 187 USPQ 481 (CCPA 1975).

Evidence of the use of hindsight in the construction of the rejection can be found in the fact that Examiner must pick and choose from conflicting teachings of the three cited references in order to find the elements of the rejected claims. For example, Applicants' independent Claims 1 and 35 both specify that the interface layer have a viscosity of at least 100 centipoise. Tetra Laval at page 4 teaches that the interface layer should have a low viscosity, preferably 50 mPas or less and more preferably 5-10 mPas. Wittosch does not teach multilayer coating, and therefore does not teach anything about the viscosity of the interface layer of a multilayer curtain. Katagiri, a reference that is not directed to coating printable paper, teaches that it is critical that the second layer have a viscosity of at least 300 mPas, and in Table 1 shows examples of an interface layer having a viscosity of 150 mPas at a shear rate of 10^{-1} , but only for a very low (5%) solids curtain. The teaching of Katagiri is clouded by the disclosure of his Comparative example 2 which indicates that a stable curtain could not be formed when the viscosity of the interface layer was 350 mPas. Faced with the conflicting teachings of Tetra Laval and Katagiri, Examiner selected the interface viscosity of Katagiri despite the fact that Tetra Laval requires a low viscosity interface layer. The art contains no guidance that would lead to such a selection. Applicants submit that it is apparent that this selection was based upon a hindsight reconstruction of the invention. Such use of hindsight is forbidden.

Similar logic applies to the selection of the solids content of the curtain, which is relevant to Claim 1. Katagiri discloses solids contents well below 40%. The only specific disclosure of Tetra Laval relating to solids is a preference for solids of 5 to 25%. Wittosch does not disclose multilayer curtain coating, and this contains no relevant teaching as to the solids content of a multilayer curtain. Accordingly, with respect to Applicants' Claim 1, it is submitted that only by the use of hindsight could Examiner construct this rejection, since the references themselves contain no teaching with respect to a multilayer curtain having a solids content of at least 40%.

Further with respect to Applicants' Claim 1, it is submitted that the claim element of "a multilayer curtain having a solids content of at least 40%" is not present in Tetra Laval, Wittosch, or Katagiri. Reconsideration of the rejection of Claim 1 over these three references is requested in view of the fact that the combined prior art

references do not teach all of the claim limitations, i.e. element 3 of the test for prima facie obviousness is not satisfied.

The patentability of Claim 42 is separately asserted. In addition to the preceding arguments concerning Claim 1, Claim 42 further specifies a paper web substrate velocity of at least 200 m/min. Tetra Laval and Wittosch are silent regarding speed. While Katagiri discloses velocities of over 200 m/min., that is only in connection with coatings having a solids content that is far below 40%. Accordingly, Applicants submit that the combination of velocity, solids, and interface layer viscosity of Claim 42 is neither taught nor suggested by the prior art.

Claims 1-6, 8-22, 24-27, 31, 34, 35, 37 and 42 stand rejected under 35 USC 103(a) as being unpatentable over Tetra Laval in view of Wittosch and JP '810 (hereinafter Konica).

Konica addresses the problem of unstable multilayer curtain flow for the preparation of photographic film. While Konica teaches that multilayer curtain coating at speeds of over 200 m/min., with the curtain having an interface layer viscosity of from 50 to 300 centipoise, can be conducted, one skilled in the art recognizes that Konica is limited to curtains having very low solids contents. For example, Example 2 of Konica discloses coating solutions having gelatin concentrations of 5.5% and 8%.

In summary, the references do not support a prima facie case of obviousness for the reasons mentioned above in connection with the rejection based on Katagiri. Regarding the first element of the three element test cited above, Applicants respectfully submit that neither Tetra Laval nor Wittosch nor Konica contain any teaching that would motivate one of ordinary skill in the art to combine their teachings, and Examiner has not provided any explanation of where such motivation can be found. The hindsight arguments presented above also apply to this Konica-based rejection.

Further with respect to Applicants' Claim 1, it is submitted that the claim element of "a multilayer curtain having a solids content of at least 40%" is not present in Tetra Laval, Wittosch, or Konica, for the reasons given above in connection with

the rejection based on Katagiri. Reconsideration of the rejection of Claim 1 over these three references is requested in view of the fact that the combined prior art references do not teach all of the claim limitations, i.e. element 3 of the test for prima facie obviousness is not satisfied.

The patentability of Claim 42 is separately asserted. In addition to the preceding arguments concerning Claim 1, Claim 42 further specifies a paper web substrate velocity of at least 200 m/min. Tetra Laval and Wittosch are silent regarding speed. While Konica discloses one example of coating on cellulose triacetate film at a velocity of over 200 m/min., that is only in connection with coatings having a solids content that is far below 40%. Accordingly, Applicants submit that the combination of velocity, solids, and interface layer viscosity of Claim 42 is neither taught nor suggested by the prior art.

B. Independent Claim 41

Claims 38, 39, 41, and 45-7 stand rejected under 35 USC 103(a) as being obvious over Tetra Leval in view of Wittosch and Katagiri, and further in view of Dittman et al. '024 (hereinafter Dittman).

Dittman discloses a multilayer bead coating process that is especially useful for the manufacture of photographic products. He discloses that the processes improved by using a low (from 1 to 8 centipoise) viscosity interface layer in conjunction with a higher viscosity adjacent layer. As Dittman himself points out in column 5, his process is disadvantageous in that it requires an additional layer compared to other bead coating processes. Dittman discloses coating rates of over 200 m/min. However, Dittman teaches bead coating and not curtain coating. Dittman does not disclose a multilayer curtain coating process wherein the curtain has a solids content of at least 40%. Indeed, Dittman does not disclose any coating having a solids content of at least 40%.

Applicants respectfully submit that the references do not support a prima facie case of obviousness for the reasons mentioned above in connection with the rejection based on Katagiri. Regarding the first element of the three element obviousness test cited above, Applicants respectfully submit that neither Tetra Laval nor Wittosch nor

Katagiri contain any teaching that would motivate one of ordinary skill in the art to combine their teachings, and Examiner has not provided any explanation of where such motivation can be found. The hindsight arguments presented above also apply to this based rejection. Dittman adds nothing to the Katagiri rejection addressed hereinabove other than to list polyethylene oxides in a very long list of surfactants.

Further with respect to Applicants' independent Claim 41, it is submitted that the claim element of "a multilayer curtain having a solids content of at least 40%" is not present in Tetra Leval, Wittosch, Katagiri or Dittman, for the reasons given above. Reconsideration of the rejection of Claim 41 over these 4 references is requested in view of the fact that the combined prior art references do not teach all of the claim limitations, i.e. element 3 of the test for prima facie obviousness is not satisfied.

The patentability of Claim 47 is separately asserted. In addition to the preceding arguments concerning Claim 41, Claim 47 further specifies that the curtain have an interface layer having a viscosity of at least about 100 centipoise. Tetra Laval, Wittosch and Dittman do not disclose such an interface layer. While Katagiri teaches that the interface layer can have a viscosity of 150 mPas, that is only in connection with curtains having very low solids contents, whereas Claim 47 specifies that the solids content of the curtain be at least about 40%. Furthermore, Dittman teaches away from the use of a high viscosity interface layer. Accordingly, Applicants submit that the combination of velocity, solids, and interface layer viscosity of Claim 47 is neither taught nor suggested by the prior art.

Claims 38, 39, 41 and 46-7 stand rejected under 35 USC 103(a) is being obvious over Tetra Laval in view of Wittosch and Konica, and further in view of Dittman. Applicants believe that the essence of this rejection is addressed above in response to the rejection based on Tetra Laval in view of Wittosch and Katagiri, and further in view of Dittman, and reconsideration of the application in view of this rejection is requested for the reasons stated hereinabove. The patentability of Claim 47 is again separately asserted.

Claim 45 and independent Claim 41 stand rejected under 35 USC 103(a) as being obvious over Tetra Leval in view of Wittosch, WO 92/11095 (hereinafter Kodak) and Dittman.

Claim 41 requires, inter alia, applying a multilayer curtain having a solids content of at least about 40 weight percent to a paper or paperboard substrate having a velocity of at least about 200 m/min. Tetra Laval discloses a multilayer curtain coating process at undisclosed speed wherein the curtain preferably has a solids content of from 5 to 25%. Wittosch mentions that coating liquids can have solids of more than 20%, but does not disclose multilayer curtain coating, and does not discuss coating speed. Kodak discloses multilayer curtain coating where the improvement is using a thin, very low viscosity (less than 1 mPas) bottom layer. Kodak does not disclose coating with a curtain having a solids content of at least 40%. Dittman does not disclose multilayer curtain coating, and does not disclose coating with the curtain having a solids content of at least 40%. In summary, none of the 4 references disclose a multilayer curtain having a solids content of at least 40%.

Applicants respectfully submit that the references do not support a prima facie case of obviousness. Examiner's argument appears to be that one of ordinary skill in the art would have been motivated to combine these four references in order to provide a multi-functional barrier coating applied at high speed since Kodak teaches that it is economically efficient to coat as fast as possible. However, this argument ignores the fact that Kodak requires a very low viscosity interface layer and a low solids curtain in order to achieve high velocities. Accordingly, Applicants do not agree that one of ordinary skill in the art would have been motivated to pick and choose the elements of Applicants' invention without the application of hindsight. Otherwise, the references contain no teaching that would suggest that a multi-functional barrier coating could be applied to paper or paperboard at a velocity of at least 200 m/min. by a multilayer curtain having a solids content of at least 40%. Applicants position is reinforced by the fact that Dittman, while directed to bead coating rather than curtain coating, also teaches that multilayer coating at velocities of over 200 m/min. can be produced using a low viscosity interface layer and a low solids curtain. Since Tetra Laval also operates a low solids, none of the references suggest the curtain coating can be operated at such velocities using a high solids curtain. Reconsideration of the rejection is respectfully requested for the foregoing reasons.

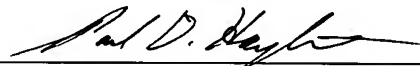
IV. Priority

Examiner's comments regarding priority are noted. However, Applicants believe no response to those comments is needed since there is no rejection based upon those comments.

V. Conclusion

For the foregoing reasons, reconsideration of the claims and passing of the application to allowance are solicited.

Respectfully submitted,



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